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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,213	03/15/2004	William L. Brenneman	102426-400	2024

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT PAPER NUMBER

1775

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/801,213

Applicant(s)

BRENNEMAN ET AL.

Examiner

Cathy Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 9-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

In view of the amendment and remarks filed on December 05, 2005, the pending claims continue to be unpatentable as following:

Claim Rejections - 35 USC § 103

1. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 5071520) or Chen et al (US 5800930) in view of Mori (US 6703564).

Chen discloses a chemically treated copper foil that is laminated to a dielectric substrate. The dielectric substrate is particularly glass filled epoxy board (col 1 L 20-21).

The copper foil includes a nodular copper/nickel alloy deposited onto the surface of the copper foil (col 2 L 8-10, L 32-34). The average height of the nodules is from about 0.5 μm - 3 μm , more preferably from about 0.7 μm – 1.5 μm (col 3 L 14-16).

A chromium/zinc anti-tarnish coating is then coated to the nodulated copper foil before laminated to the dielectric substrate (col 5 L 53-57). The examiner takes the position that the chromium/zinc coated nodular layer resembles the presently claimed laser ablation inhibiting layer.

The peel strength between the treated copper foil and the dielectric substrate is 11.7 lbs/in (col 5 L 56-59).

Chen although is silent about the reflectivity value of the laser ablation inhibiting layer. In view of applicant's disclosure (Fig. 9), it would be inherent that Chen possesses the claimed reflectivity since reflectivity is depended upon the nodule height and the nodule height directly relates to the peel strength. Chen discloses the claimed

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nodular height range and the peel strength; therefore it is inherent that Chen's anti-tarnishing coating layer possesses the claimed reflectivity.

Lin teaches a copper or copper base alloy foil used for bonding to a dielectric support layer, to make a printed circuit board. The dielectric support layer can be a fiberglass reinforced epoxy resin or a polyimide (col 1 L 23-26).

The copper or copper base alloy foil (or metal foil) is electrolytically treated on the surface adhering to the support layer. The treatment includes electrolytically forming dendrites on the surface (col 3 L 21-24). Then, a coating of zinc is used to cover the dendritic surface, followed by a chromate treatment (or an antitarnish treatment) (col 3 L 40-47 & L 63-65).

Lin also teaches that an anti-tarnish treatment that may include both chromium and zinc ions can be applied to the metal foil (col 4 L 13-15).

Lin's treated foil has a peel strength of at least 7 pounds per inch (col 5 L Examples A-E).

The examiner takes the position that the anti-tarnishing treatment disclosed by Lin resembles the laser ablation inhibiting layer since it is made up of both chromate and zinc oxide material as claimed by the applicant (col 5 Example C).

Lin is silent about the reflectivity of the laser ablation inhibiting layer. Since the lamination peel strength is related to the reflectivity, and Lin teaches the claimed peel strength and all the claimed materials for the layer, inherently the reflectivity would be within the claimed range.

Both Lin and Chen teach a chromium and/or zinc treated copper foil which is to used to bond to a glass reinforced epoxy resin layer or a polyimide (Chen, col 1 L 20-21; Lin, col 1 L 24-26). The examiner is taking the position that inherently Chen and Lin's treated copper foil would prevent laser beam to pierce through the copper foils, because Chen and Lin's copper foils anticipate the claimed laser ablation inhibiting layer (i.e. the chromium and/or zinc oxide anti-tarnish coating), peel strength, and nodular height.

The prior art however silent about having via holes in the dielectric layers.

Mori teaches a printed wiring board comprised of a dielectric layer (3) which is formed onto a (or a plurality of) prepreg layer(s), then via hole (6,7) are laser drilled through the dielectric layer (3) (col 3 L 39-45 & Fig. 1).

In view of the prior art teachings, one skill in the art would choose a dielectric substrate with blind via holes or any forms of via holes because via holes can form electrical connections between the surfaces and it is well known in the circuit board field.

Response to Arguments

2. Applicant's arguments filed December 05, 2005 have been fully considered but they are not persuasive. Applicant traverses the office action and argues that the prior art references alone or in combination, do not anticipate nor make obvious over the present invention.

3. In response to applicant's arguments, Chen and Lin both teach the presently claimed copper foil with a chromium/zinc coating. Both prior art clearly teaches the peel

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strength between the copper foil and the insulating layer, after it has been coated with the chromium/zinc coating, as well as the nodular height. The prior art don't teach having via holes in the insulating layers; however forming via holes in a dielectric or insulating layer is well known in the printed wiring boards. Thus, the rejection is believed to be appropriate and sustained.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam
Primary Examiner
Art Unit 1775

cfl
Jan 23, 2006